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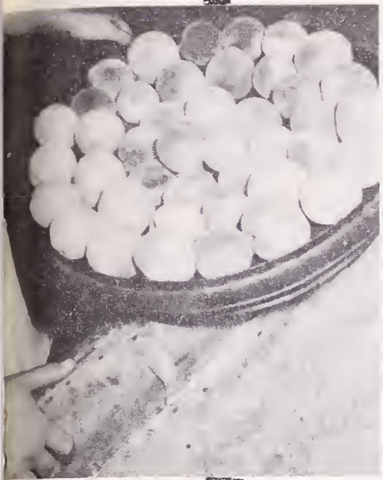
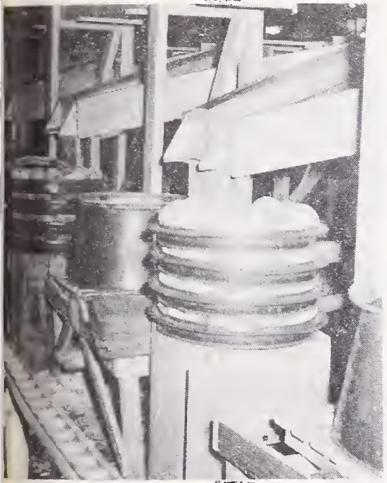


COSTS of MARKETING CAROLINA PEACHES in 1954



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U. S. DEPARTMENT OF AGRICULTURE

Marketing Research Report No. 103

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Agricultural Marketing Service, Washington, D. C.
U. S. DEPARTMENT OF AGRICULTURE

PREFACE

An active and continuing interest in research relating to the packing and handling of peaches for the fresh market has been evidenced by growers and shippers alike. Costs and methods of handling the riper fruit in moving it from the packinghouse platform to the markets where it is consumed are some of the factors influencing growers and packers in planning their marketing program.

This study on costs of marketing Carolina peaches in 1954 is one phase of a general project on marketing fresh peaches that was initiated in response to a recommendation of the Deciduous Fruit and Tree Nut Research and Marketing Advisory Committee operating under provisions of the Agricultural Marketing Act of 1946.

During the 1953 season the Agricultural Marketing Service initiated a study of costs of marketing South Carolina peaches in New York City, with some attention given to the relationship between costs incurred in maintaining high quality in peaches shipped fresh and the returns received by growers for the higher quality fruit. Hydrocooling was one of the processes in the quality improvement program which was singled out for observation. No report was issued on the 1953 study.

This study of peach marketing intensifies the investigation of packing and handling costs, and expands the geographical coverage to include both of the Carolinas.

It is anticipated that this cost study in the Carolinas will be followed by similar work in the midwestern and western peach producing areas. In this way it will be possible to provide information necessary for evaluating peach marketing methods in the various areas and on which comparisons of marketing costs among the major peach producing areas of the United States may be based.

The excellent cooperation of growers, packers, and shippers who permitted the author to observe operations at the packinghouse is appreciated. Access to necessary accounting and sales records was also provided by these same people.

In carrying on the field work at the packinghouses in North Carolina, the author was given substantial assistance by W. D. Toussaint and George S. Abshier, of the North Carolina State College. In South Carolina particular recognition is due Toy A. Hyder, Jr. of the South Carolina Peach Growers Association, and Roy J. Ferree, of Clemson Agricultural College, both of whom gave the author valuable information. Acknowledgment is also due to members of the AMS staff in Washington, D. C., who offered constructive suggestions for improving the manuscript.

The study on which this report is based was conducted under authority of the Agricultural Marketing Act of 1946.

COSTS OF MARKETING CAROLINA PEACHES IN 1954

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HIGHLIGHTS

During July 1954 peach-packing operations were observed in 14 plants located in the Sandhills area of North Carolina and in the vicinity of Spartanburg, S. C. In this study the major emphasis was on packing costs, including hydro-cooling, but attention was also given to transportation and selling charges incurred in delivering the peaches to market. Included in the packinghouse operation were dumping, grading, facing, filling, cooling, lidding, labeling, and loading as well as the general and supervisory functions. Two sizes of baskets, the 3/4 bushel and the bushel, were being used by the 14 packinghouses at the time observations were made.

Extreme care should be exercised in drawing from the indicated returns any definite and unqualified conclusion that it is more profitable to pack peaches in 3/4-bushel baskets than it is to use the full bushel. In no case was it possible in the course of this study to observe the comparative returns from peaches marketed in the two containers where both were packed by the same shipper from the same lot of fruit.

The major findings of this study are as follows:

1. The average time required in packing a 3/4-bushel basket of fresh peaches was 15.1 man-minutes for the 9 packinghouses using this particular container. In the 5 plants where the bushel basket was used the time required in the packinghouse operations was 16.7 man-minutes per basket.

2. The cost of direct labor required to pack a basket of peaches averaged 15.6 cents in the 9 plants where the 3/4-bushel container was used and 16.4 cents in the 5 plants using the full bushel. The labor cost per bushel of peaches packed was, therefore, lower for the bushel basket than for the 3/4 bushel.

3. Average wages paid to workers in the 14 peach packinghouses were $0.62 per hour.

4. For the peaches packed in 3/4-bushel baskets the average price received f.o.b. market was $4.29 per container. The range in returns was from $3.26 to $5.79 per basket. For the regular bushel the average gross was $4.45, and the range in the market price was from $4.07 to $5.25 per basket.

5. From 15 to 20 percent of the return for peaches delivered to market was absorbed by the cost of transportation of packed fruit from the production area.

6. Selling charges made up about 6 percent of the gross returns realized by the shippers of the peaches involved in this study.

7. Total expenses, both direct and indirect, incurred at the packinghouse level in the marketing of Carolina peaches averaged $0.81 in 9 plants packing the 3/4 bushel and $0.86 in the 5 sheds where full bushels were used. These packing costs represented 19 percent of the average gross returns from the 3/4-bushel baskets and 19.3 percent of the value of bushels f.o.b. market. Thus, the total expense per bushel of peaches packed was lower for the bushel basket than for the 3/4 bushel.

8. The net return for peaches averaged $2.16 per 3/4 bushel and $2.27 per bushel basket. In terms of the percentage of the value of the packed fruit delivered to market that is represented by the adjusted net return, the calculated return at packinghouse receiving platform averaged 50 percent on the peaches packed in 3/4-bushel baskets and 51 percent where full bushels were used.

9. At levels of operation above one-third of plant capacity fixed costs are a relatively minor part of the total packing cost.

10. In 1954 the 14 packinghouses covered by this study were not operating at much more than 50 percent of capacity.

11. At the operating level that prevailed in 1954, average actual costs of packing peaches in the Carolinas closely approximated the estimated costs at 50 percent of capacity, as computed for a new 7-roll packinghouse.

BACKGROUND

The South Atlantic States are the source of a substantial part of the peaches marketed in the fresh form in the eastern half of the United States. Within this region the Carolinas, particularly South Carolina, are among the important peach-producing States. In 1954 the output of peaches in North Carolina was about 1,150,000 bushels, mostly in the Sandhills district, and South Carolina had a crop totaling 3,350,000 bushels. In this production area only a minor part of the peach crop is used for processing purposes. The heavy movement of fresh peaches from the Carolinas, mostly to eastern markets, begins in June and continues until the first part of August.

PROCEDURE

During July 1954 packing operations were observed in detail for one day at each of 14 peach packinghouses, 10 of which were located in the Sandhills section of North Carolina and 4 of which were near Spartanburg, S. C. The North Carolina phase of the field work in this 1954 study was conducted at substantially the same time and in the same plants as the North Carolina State College investigation of costs and general economics of hydrocooling.1/

Beyond the actual packing of the fruit, the 1954 work included tracing identical lots of peaches through the marketing process to the initial point of delivery in the consuming markets.2/ A detailed analysis was made of labor requirements and costs at each stage in the packing process. Other packing costs, such as containers, ice, and the several items of indirect overhead expense, were measured at the packinghouse level. Still other deductions from the value of the peaches f.o.b. market included transportation and selling charges. The end result in each case represented the value, f.o.b. packinghouse platform in field lugs, of the peaches shipped, with consideration being given to the adjustment for cull fruit picked out in the grading and packing process.

Nine of the 14 packinghouses in which observations were made for 1 day were packing peaches in 3/4-bushel baskets on that particular day. The other 5 were using the conventional bushel tub basket that has been the standard container for southeastern peaches over a long period of time. These 2 container sizes are the basis of the cost analyses in this report; however, a considerable number of both 1/2-bushel baskets and wire-bound boxes of peaches also were being packed in the Carolinas during the survey period in July.

PACKINGHOUSE LABOR

With only minor variations, the packing process used in preparing Carolina peaches for market was similar in all of the plants surveyed. In common with the preparation of most other kinds of fruits for the fresh market, peaches are graded and packed in what is basically a hand operation. For this reason the labor inputs make up an important element of cost in the packing process. The major steps requiring hand labor in packing peaches in tub baskets

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1/ Toussaint, W. D., Hatton, T. T., and Abshier, George S. Hydrocooling Peaches in the North Carolina Sandhills. N. C. Agr. Exp. Sta. A. E. Information Series No. 39. February 1955.

2/ The information on returns for peaches packed on the days when observations were made was obtained at the close of the season from sales records of the growers and shippers.

include (1) dumping and grading the fruit as it arrives at the packinghouse from the orchard, (2) making up the facings of the packed baskets, (3) filling the tubs, (4) placing the filled containers in and removing them from the hydrocooler, and finally (5) lidding, labeling, and loading the packed fruit. In the packing of peaches for shipment in fresh form certain other operations are either fully mechanical or require only a relatively small labor input. The more important of these latter steps are defuzzing, sizing, and waxing.

Time Requirements 3/

The average time required in packing a 3/4-bushel basket of fresh peaches was 15.1 man-minutes for the 9 packinghouses using this particular container. Included in the packinghouse operation were dumping, grading, facing, filling, cooling, lidding, labeling, and loading as well as the general and supervisory functions. In the 5 plants where the bushel basket was used the time required in the packinghouse operations was 16.7 man-minutes per basket.

Dumping peaches from the field lugs to the grading line and piling the empty lugs required from 0.5 to 1.3 man-minutes in the plants using 3/4-bushel baskets (table 1). In the houses packing full bushels, the range was from 0.9 to 2.2 man-minutes per container (table 2). The average per container was 0.9 man-minutes for the 3/4-bushel and 1.4 man-minutes for the bushel.

Grading, which consists of picking out the "off-grade" or cull fruit, is a major activity in all plants that pack fresh peaches. In packing 3/4-bushel baskets, grading required from 2.2 to 4.9 man-minutes. For bushels the range was from 1.8 to 6.8 man-minutes. The average for 3/4 bushels was 3.4 man-minutes per container and for bushels it was 4.0 man-minutes.

Facing, or ringing, the fruit is another important activity wherever baskets are used in packing peaches for the fresh market. Almost 3.2 man-minutes were required in facing the average 3/4-bushel basket--the range was from 1.9 to 4.8 man-minutes. The same operation averaged 2.9 man-minutes for the bushel baskets with a range of 1.2 to 4.7 in the man-minutes required per container. There is some evidence to support the industry opinion that it is actually more difficult to face the smaller containers.

Filling or busheling is the next important operation in packing peaches in baskets. This step required an average of 3.1 man-minutes in the 9 packinghouses where 3/4-bushel containers were used and 3.3 man-minutes in the other plants using the full bushel baskets. The range among the 9 plants was from 1.8 to 5.3 man-minutes per 3/4 bushel packed and, in the 5 plants using bushel baskets, the range was from 1.6 to 5.3 minutes.

Hydrocooling peaches required relatively little direct labor. This process involved placing baskets of packed fruit in the cooler, removing them from the cooler, and keeping the equipment properly iced. At this stage the average labor input for all 14 packinghouses was 0.9 man-minutes per container. The range was from 0.6 to 1.7 man-minutes for the 3/4 bushels and from 0.6 to 1.3 man-minutes for the bushel containers.

3/ As a necessary prelude to determination of labor costs the time required for performing each of the various packing operations was measured in each packinghouse. In each case the time requirement was based on the total man-minutes put in that day by the workers engaged in the particular operation under observation. Unit inputs were obtained by dividing total man-minutes by the number of baskets packed during the day.

Table 1.--Labor requirements per 3/4-bushel tub basket in packing peaches for the fresh market, 9 Carolina packinghouses, July 1954

Operation	Packinghouses									Average
	A	B	C	D	E	F	G	H	I	
	Man-minutes	Man-minutes	Man-minutes	Man-minutes	Man-minutes	Man-minutes	Man-minutes	Man-minutes	Man-minutes	Man-minutes
Dumping	0.78	1.06	0.91	0.89	1.27	0.52	0.97	0.66	0.95	0.89
Grading	2.87	4.24	4.79	2.21	2.87	2.33	4.88	2.95	3.87	3.44
Facing	3.14	4.77	3.42	1.92	1.91	2.59	3.66	4.27	2.81	3.17
Filling	4.18	5.30	2.28	2.21	1.91	1.81	4.39	2.95	3.24	3.14
Cooling	.55	1.70	.71	.62	1.05	.84	1.01	1.11	.79	.93
Lidding, labeling, and loading	2.09	2.65	2.28	2.21	1.11	1.55	1.71	1.97	1.77	1.93
General	1.30	1.59	.91	.59	.64	.78	.97	.98	.60	.93
Supervisory	.78	1.06	.57	.44	.32	.52	1.46	.66	.60	.71
Total	15.69	22.37	15.87	11.09	11.08	10.94	19.05	15.55	14.63	15.14
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Cull ratio	18	13	9	28	19	20	24	16	19	18.4

Table 2.--Labor requirements per bushel tub basket in packing peaches for the fresh market, 5 Carolina packinghouses, July 1954

Operation	Packinghouses					Average
	J	K	L	M	N	
	Man-minutes	Man-minutes	Man-minutes	Man-minutes	Man-minutes	Man-minutes
Dumping	1.18	2.25	1.25	0.90	1.54	1.42
Grading	3.15	6.75	1.79	3.38	5.13	4.04
Facing	4.72	2.81	1.25	2.03	3.59	2.88
Filling	3.93	5.34	1.61	2.71	3.08	3.33
Cooling	1.07	.96	.63	.83	1.26	.95
Lidding, labeling, and loading	2.36	2.25	2.15	2.48	2.57	2.36
General	.79	2.25	.54	1.35	1.03	1.19
Supervisory	.39	.56	.54	.68	.51	.54
Total	17.59	23.17	9.76	14.36	18.71	16.71
	Percent	Percent	Percent	Percent	Percent	Percent
Cull ratio	15	28	8	16	15	16.4

Lidding, labeling, and loading are the last steps in packing peaches for the fresh market. In the 9 plants packing 3/4 bushels, these operations required an average of 1.9 man-minutes per basket while 2.4 man-minutes was the average time for the packinghouses using the bushel. The range among the 9 plants was from 1.1 to 2.6 man-minutes, but among the 5 sheds using bushel baskets it was considerably narrower -- 2.1 to 2.6 man-minutes.

General labor, which was devoted mostly to the handling of cull fruit, accounted for an average of 0.9 man-minutes per container where the 3/4 bushels were packed and 1.2 man-minutes where bushel baskets were used. Among the 9 sheds packing 3/4 bushels the general labor ranged from 0.6 to 1.6 man-minutes, while in the other 5 plants the range was from 0.5 to 2.2 man-minutes per bushel basket.

In each of the peach packinghouses there was at least one person who directed the general operations and supervised the activities of the entire crew.

In several cases the supervisor was the owner of the plant. Generally he was assisted by a foreman or forewoman who directed certain operations in the packing process. Man-minutes required for performance of the supervisory function ranged from 0.3 to 1.5 per 3/4 bushel and from 0.4 to 0.7 per bushel. The averages were 0.7 man-minutes per 3/4 bushel and 0.5 man-minutes per bushel for the two groups of packing plants.

Labor Costs in Packing[4]

The cost of direct labor required to pack a basket of peaches averaged 15.6 cents in the 9 plants where the 3/4-bushel container was used and 16.4 cents in the 5 plants using the full bushel. The range on the 3/4 bushel was from 10.0 to 22.3 cents and on the bushel basket it was from 12.0 to 19.9 cents per unit packed.

At the first stage in the packing of peaches, it is indicated by tables 3 and 4 that dumping the fruit from field lugs and repiling the empty containers cost 0.9 cents per 3/4 bushel packed and 1.3 cents per bushel basket turned out. Among the 9 plants using the 3/4-bushel baskets this cost ranged from 0.5 to 1.3 cents per container. The comparable figure for the other 5 sheds ranged from 1.0 to 1.9 cents per packed bushel.

Grading of the fruit involved a labor cost that averaged 3.0 cents per 3/4 bushel and 2.9 cents per bushel basket. The range among the plants packing 3/4 bushels was from 1.8 to 5.0 cents while on bushels it varied from 1.5 to 5.1 cents. It was noted that the plant having the lowest percentage of cull fruit also had the lowest grading cost per unit packed. This relationship between cull ratio and grading costs was not consistent, however, which indicates that factors other than the quality of the fruit are also important in determining the cost of grading.

Facing, or ringing, cost another 3.2 cents per 3/4 bushel and 3.3 cents per bushel. This operation required labor costing from 1.9 to 4.3 cents in those houses packing 3/4 bushels and from 2.6 to 4.7 cents where the bushel basket was used.

Filling, or busheling, averaged 3.1 cents and ranged from 1.5 to 4.9 cents in the 9 plants where 3/4-bushel baskets were packed. In the 5 sheds using bushel baskets this item of cost ranged from 2.6 to 4.5 cents with an average of 3.4 cents for the group.

Hydrocooling required direct labor that cost an average of 0.9 cents per packed container in all of the 14 plants surveyed. The range in this item of cost was from 0.5 to 1.4 cents.

Lidding, labeling, and loading averaged 1.9 cents per 3/4 bushel and 2.3 cents where the full bushel was packed. The range in this unit labor cost was from 1.1 to 2.7 cents for the 3/4-bushel basket and from 1.8 to 3.7 cents in the 5 sheds packing bushels.

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[4] Based on actual wages paid at each packinghouse where packing operations were observed in July 1954.

Table 3.--Direct labor costs per 3/4-bushel tub basket in packing peaches for the fresh market, 9 Carolina packinghouses, July 1954

Operation	Packinghouses									Average
	A	B	C	D	E	F	G	H	I	
	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents
Dumping........	0.65	1.06	0.91	0.89	1.27	0.52	1.14	0.55	1.19	0.90
Grading........	2.11	2.83	3.99	1.84	2.39	1.94	4.96	2.95	4.19	3.02
Facing.........	2.35	3.98	3.71	2.50	1.91	2.16	4.27	4.27	3.27	3.16
Filling........	3.50	4.24	2.47	2.95	2.07	1.51	4.92	2.46	4.05	3.13
Cooling........	.46	1.42	.77	.62	1.04	.70	1.18	.92	.99	.90
Lidding, labeling, and loading......	1.96	2.65	2.55	1.84	1.11	1.55	1.71	1.64	2.13	1.90
General........	1.19	1.55	.91	.49	.64	.65	1.05	.82	.76	.90
Supervisory....	1.96	2.65	1.42	1.11	.79	.97	3.05	1.23	1.52	1.63
Total........	14.18	20.38	16.73	12.24	11.22	10.00	22.28	14.34	18.10	15.55

Table 4.--Direct labor costs per bushel tub basket in packing peaches for the fresh market, 5 Carolina packinghouses, July 1954

Operation	Packinghouses					Average
	J	K	L	M	N	
	Cents	Cents	Cents	Cents	Cents	Cents
Dumping......	1.18	1.87	1.04	1.13	1.28	1.30
Grading......	1.90	5.06	1.49	2.82	3.42	2.94
Facing.......	4.72	2.58	3.00	3.00	2.99	3.26
Filling......	3.93	4.45	2.60	3.50	2.57	3.41
Cooling......	1.07	.80	.52	.94	1.05	.88
Lidding, labeling, and loading.	2.10	1.87	1.79	3.69	2.05	2.30
General......	.79	1.87	.45	1.13	.86	1.02
Supervisory..	.98	1.41	1.12	1.47	1.28	1.25
Total.......	16.67	19.91	12.01	17.68	15.50	16.36

The cost of general labor, which was employed mostly in the handling of cull fruit, was 0.9 cents per 3/4 bushel and 1.0 cents per bushel basket packed. Packinghouse supervision, which is another form of general labor, averaged 1.6 cents in the plants packing 3/4-bushel baskets. This item averaged 1.3 cents where the full bushel was packed.

Wage Rates

Average wages paid to workers in the 14 peach packinghouses were $0.62 per hour. This figure is indicated by table 5 and it relates both to the packinghouses as units and to the packing functions performed in all of the plants. The average wage for each packinghouse was obtained by dividing the total wages paid for the day of observed operation by the number of man-hours put in that day by the entire group of workers. On the basis of individual functions, the averages are a simple mean of the rates paid for each function by the 14 packing plants. In applying this weighting process it was found that average wages paid by the individual packinghouses ranged from $0.50 per hour to $0.74 per hour. The spread in actual wage rates paid to the several classes of labor engaged in the different operations showed a much wider range. Actual hourly rates varied from about $0.40 per hour for strictly unskilled labor to a high of $2 per hour where supervisory help was involved.

Table 5.--Average hourly wage rates of labor used in packing peaches, by plant and by function, 14 Carolina packinghouses, July 1954

Packinghouse	Wage rate 1/	Function	Wage rate
	Dollars		Dollars
A	0.54	Dumping	0.59
B	.55	Grading	.49
C	.63	Facing	.67
D	.66	Filling	.63
E	.66	Cooling	.58
F	.55	Lidding, labeling, and loading	.59
G	.70		
H	.58	General	.56
I	.74	Supervisory	1.40
J	.57		
K	.52	Average	2/.62
L	.74		
M	.74		
N	.50		
Average	.62		

1/ The hourly rate is a weighted average based on the aggregate wages paid divided by total hours worked by the packinghouse crew.

2/ This average is weighted to reflect the allocation of time required to perform each of the several packing functions.

In general, the lowest wage rates were paid to workers in the grading operation. Table 5 shows an average of $0.49 per hour for the group performing the grading function. On the basis of the wage rates of graders it seemed that the packinghouse operators considered the grading job one that called for the least skill and physical strength. Functions for which intermediate wage rates averaging $0.55 to $0.60 per hour were paid included dumping, cooling, lidding, labeling, loading, and general. In performing most of these jobs there is need for the worker to have the physical strength required to do heavy lifting. Skill is only a secondary requirement.

Skill and speed are important factors in facing and filling, particularly in facing or ringing. Strength is also needed in the filling operation where each tub filled must be lifted to a conveyor. Average wages paid facers were $0.67 per hour while the fillers or bushelers received $0.63 per hour. In several packinghouses both facing and filling were piece rate operations, which may account in part for the relatively higher average wages received by the workers on these particular jobs.

In computing the wage rates for supervisors in the packinghouses it was necessary in a number of cases to use an arbitrary wage for those owners who served as foremen or overseers. A flat rate of $1.50 per hour was adopted for this purpose. The average wage paid for supervisory labor in the 14 plants was $1.40 per hour.

Observations

Packing peaches for fresh market is strictly a short-term seasonal operation. In the Carolinas the maximum annual run rarely exceeds 8 to 10 weeks; even then, it is unusual for a packinghouse to operate consistently for more than 3 or 4 days each week during the shipping season. In these circumstances it is the usual practice to utilize local labor in the packing process. Itinerant packinghouse labor that moves from one area to another as crops mature is not used extensively in the packing of Carolina peaches. In a few cases a limited number of workers, particularly in the supervisory group, were brought in from areas such as Florida, but this was the exception.

Local people who worked in the packing sheds were mostly farm hands, high school students, housewives, and school teachers. The peach season occurs during the school vacation period, which makes it possible to use both students and teachers in the packing plants. Some of these seasonal workers pack peaches year after year and thus acquire considerable skill. From season to season the turnover in workers is very high, however, and this means that a substantial training job must be done at the beginning of each season. It is at this point that some packinghouses have an obvious need for a more systematic approach. In many cases it appears that output is at a much lower level than necessary simply because the workers do not know their jobs well enough or because the crews are not too well coordinated. Even after allowing for the fact that some plants turn out a much better quality of pack than others, it is still hard to explain the extremely wide range in man-minutes required to perform the various jobs in the packing process.

Where an operation is as uniform as it was found to be in the peach packinghouses of the Carolinas, it normally would be expected that the time required to perform a function such as grading would be related closely to the percentage of culls in each lot of fruit. Within rather broad limits, however, the relative quantity of culls picked out by the graders provided little or no explanation of variations in the time required for that job. Some of the differences in time requirements among the plants surveyed were the result of breaks between lots of fruit or of work stoppages caused by temporary breakdown of equipment and waiting for peaches to be hauled from the orchard.

Observations made during the course of this study indicate that, aside from quality of the pack being turned out by a plant, the major determinant of time required in packing a basket of peaches was the general tempo or pace of the entire work crew, which in turn was determined in part by the manner in which the workers were assigned to the various jobs. Maintenance of a steady flow of fruit through the line is essential to efficient operation. To keep the fruit moving at the maximum rate consistent with a good job of packing sometimes requires timely shifts of workers from one point on the line to another. Careful supervision of the dumping of the fruit from the field boxes is essential at all times.

In a few cases, the same group of workers were used for picking the peaches and then later for packing the fruit. It is reported that this practice was at one time quite general in the southeastern peach area, but it has been abandoned in most places during recent years. Although it logically could be expected that the workers who had first picked the fruit would be tired when they started packing, this fatigue did not seem to impair their performance seriously; the workers were anxious to receive the additional compensation. This comment must be viewed in light of the limited observations involved, however, since general abandonment of the picking-packing crews indicates that packinghouse operators have found separate work groups preferable. Also, the increase in packing of peaches on a custom basis has tended to eliminate the single crew for picking and packing.

MARKETING COSTS AND GROWER RETURNS

Prices received for peaches packed and shipped during those days in July 1954 when packing operations were being observed in the Carolinas have been established on a uniform basis of value per packed basket, f.o.b. point of initial delivery in the consuming market. In this study no effort was made to measure the margins taken by wholesalers and retailers. From the packinghouse receiving platform to point of initial delivery in the consuming market the major marketing costs incurred are those associated with the packing operations, the cost of transportation from the production area to market, and the selling charges of sales agents or commission men.

In order to compute the value of the orchard-run peaches as they were delivered at the packinghouse platform, it was necessary to adjust the net value of the packed peaches to reflect the lesser value of the culls removed in the packing process. By converting the final adjusted return per packed basket to a price per pound of fruit, it is possible to make direct comparisons of the net returns whether the bushel or 3/4-bushel basket was used by the shipper. Tables 6 and 7 show the breakdown of the spread between value of the peaches f.o.b. packinghouse platform in field boxes and the return for the packed product delivered to market. These same data are summarized in figures and 2.

Table 6.--Costs incurred in moving 3/4-bushel tub baskets of fresh peaches from packinghouse platform to initial point of delivery in consuming market, 9 Carolina shippers, July 1954

Item	Packinghouses									Average	Percentage of gross return
	A	B	C	D	E	F	G	H	I		
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Percent
Gross return, f.o.b. market	4.94	4.61	5.79	4.48	3.65	3.32	3.26	3.42	5.13	4.29	100.0
Transportation and handling	.65	.70	.81	.96	.65	.66	.61	.76	.72	.72	16.8
Selling charges	.49	.46	.50	.11	.12	.18	.25	.23	.43	.31	7.2
Net return, f.o.b. shipping point	3.80	3.45	4.48	3.41	2.88	2.48	2.40	2.43	3.98	3.26	76.0
Packinghouse expenses:											
Direct labor	.1418	.2038	.1673	.1224	.1122	.1000	.2228	.1484	.1810	.1555	3.6
Packing materials	.4526	.4566	.4500	.4456	.4566	.4566	.4456	.4566	.4456	.4518	10.5
Ice and power	.0510	.0734	.0590	.0686	.0776	.0500	.0916	.0720	.0596	.0670	1.6
Repairs and maintenance	.0167	.0088	.0259	.0206	.0265	.0143	.0401	.0164	.0143	.0204	.5
Depreciation	.0975	.0854	.0519	.0422	.0430	.0543	.0601	.0764	.0893	.0667	1.6
Insurance, taxes, misc	.0408	.0576	.0706	.0965	.0323	.0334	.0382	.0401	.0594	.0520	1.2
Total packinghouse expenses	.8004	.8856	.8247	.7959	.7482	.7086	.8984	.8099	.8492	.8134	19.0
Net value of fruit packed, f.o.b. packinghouse receiving platform	3.00	2.56	3.66	2.61	2.13	1.77	1.50	1.62	3.13	2.44	57.0
Adjustment of culls	.39	.22	.26	.50	.26	.19	.16	.13	.45	.28	6.6
Adjusted net return for fruit delivered, f.o.b. packinghouse receiving platform:											
Per 3/4 bushel	2.61	2.34	3.40	2.11	1.87	1.58	1.34	1.49	2.68	2.16	50.4
Per pound	.064	.057	.083	.051	.046	.039	.033	.036	.065	.053	---

Table 7.--Costs incurred in moving bushel tub baskets of fresh peaches from packinghouse platform to initial point of delivery in consuming market, 5 Carolina shippers, July 1954

Item	Packinghouses					Average	Percentage of gross return
	J	K	L	M	N		
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Percent
Gross return, f.o.b. market	4.07	4.15	4.70	5.25	4.07	4.45	100.0
Transportation and handling	.82	.90	1.02	1.00	.82	.91	20.5
Selling charges	.18	.18	.20	.18	.18	.18	4.0
Net return, f.o.b. shipping point	3.07	3.07	3.48	4.07	3.07	3.36	75.5
Packinghouse expenses:							
Direct labor	.1667	.1991	.1201	.1768	.1550	.1636	3.7
Packing materials	.4736	.4634	.4716	.4716	.4736	.4708	10.6
Ice and power	.0705	.0737	.0790	.0790	.1072	.0819	1.8
Repairs and maintenance	.0071	.0167	.0200	.0064	.0067	.0114	.3
Depreciation	.0428	.1450	.0875	.0288	.1034	.0815	1.8
Insurance, taxes, misc	.0336	.0588	.0551	.0571	.0462	.0502	1.1
Total packinghouse expenses	.7943	.9567	.8333	.8197	.8921	.8594	19.3
Net value of fruit packed, f.o.b. packinghouse receiving platform	2.28	2.11	2.65	3.25	2.18	2.50	56.2
Adjustment for culls	.18	.30	.14	.36	.17	.23	5.2
Adjusted net return for fruit delivered, f.o.b. packinghouse receiving platform:							
Per bushel	2.10	1.81	2.51	2.89	2.01	2.27	51.0
Per pound	.040	.035	.048	.056	.039	.044	---

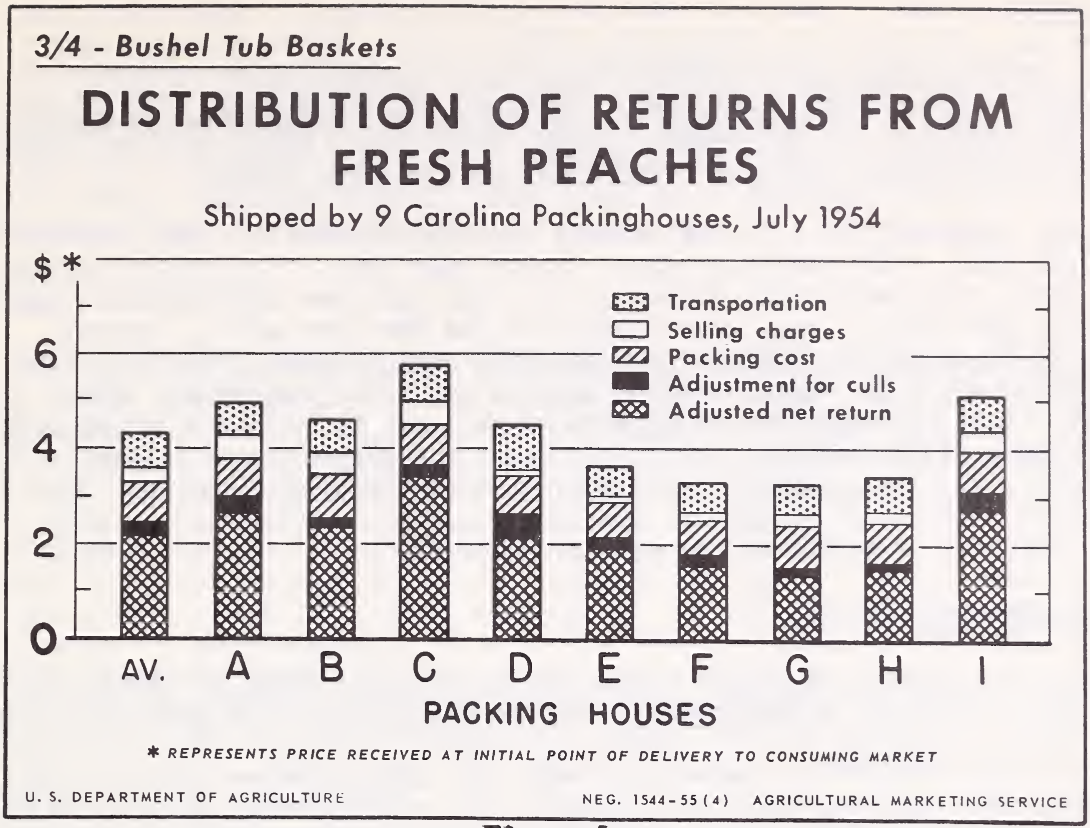


Figure 1

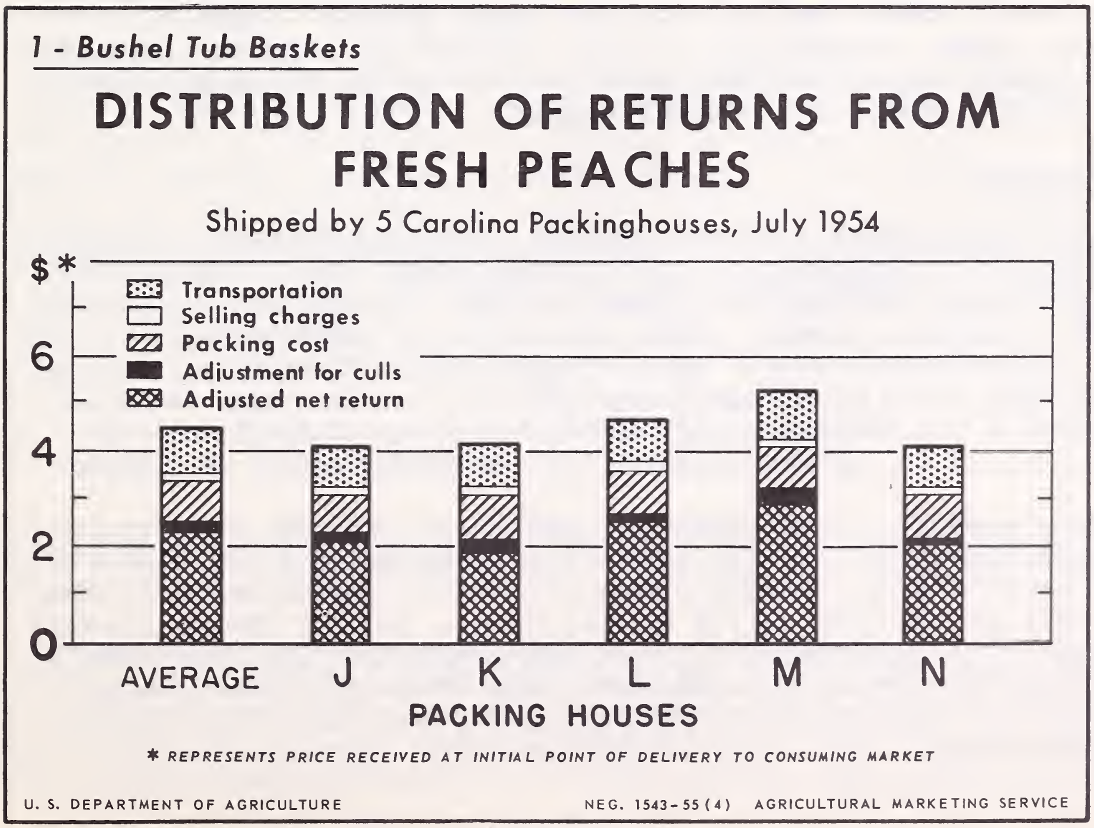


Figure 2

Gross Returns

For peaches packed in 3/4-bushel baskets the average price received f.o.b. market was $4.29 per container. The range in returns was from $3.26 to $5.79 per basket. For the regular bushel the average gross was $4.45, and the range in the market price was from $4.07 to $5.25 per basket.

A wide range was found in the returns from the 14 lots of fresh peaches packed while this study was in progress during July 1954. The bulk of these peaches, which represented the output of the packinghouses for the days when observations were being made, were shipped to the New York area. Several varieties of peaches were included and the time period ranged from July 7 to July 28, which would in itself explain much of the price variation. Where sales were f.o.b. packinghouse an adjustment was made to reflect the transportation from the point of sale to the market where the peaches were delivered. Aside from the factors mentioned as influencing the returns there was also the important element of quality in the individual lots, which undoubtedly affected the price received by the various shippers.

Transportation and Handling

From 15 to 20 percent of the return for peaches delivered to market was absorbed by the cost of transportation of packed fruit from the production area.

With the few exceptions where railroads were used, peaches packed during the observation period were shipped by truck. In recent years trucks have been taking over an increasingly larger part of the job of moving Carolina peaches to market. The average cost of transportation and incidental handling was $0.72 for the 3/4 bushel and $0.91 for the bushel baskets. Depending on destination, extent of incidental services rendered, and form of transportation, the total charge ranged from $0.61 to $0.96 on the 3/4-bushel baskets and from $0.82 to $1.02 on the bushel baskets.

Selling Charges

Selling charges made up about 6 percent of the gross returns realized by the shippers of the peaches involved in this study. Most of the peaches shipped by packers whose operations were observed were handled on a straight or modified consignment basis. A few were shipped on joint account, but this practice is not used extensively in the Carolina peach industry. It was not unusual to find that a packer had entered into an agreement with one sales agent whereby it was understood that the one agent was to handle all or practically all of the peaches packed by the particular grower or shipper.

Varying commission rates were found to prevail among the sales agents. In some cases the charge was a percent of the gross return f.o.b. market or of the price received f.o.b. packing plant, but in other instances a flat rate per unit sold was the basis of the selling charge. Selling charges averaged $0.31 on the 3/4 bushel and $0.18 on the bushel baskets. The range among the individual shippers was from $0.11 to $0.50 on the 3/4-bushel baskets, and in 4 of the 5 cases where the full bushel was used the selling charge was $0.18 per basket.

The lesser cost of selling the bushel basket is due to the fact that all of the shippers who packed bushel baskets sold their fruit through agents, both cooperative and private, who made a flat unit charge for selling. Conversely, most of the peaches shipped in 3/4-bushel baskets were handled on consignment, with the selling charge varying according to the price received for each lot. During the period of this study the peach market was relatively high and selling charges based on percentage were also high in relation to the flat rates charged by some agents.

Packinghouse Expenses

Total expenses, both direct and indirect, incurred at the packinghouse level in the marketing of Carolina peaches averaged $0.81 in 9 plants packing the 3/4 bushel and $0.86 in the 5 sheds where full bushels were used. These packing costs represented 19 percent of the average gross returns from the 3/4-bushel baskets and 19.3 percent of the value of bushels f.o.b. market.

Expenses incurred in packing peaches may be classified in two broad groups: The first is made up of the direct costs such as labor, materials, ice, and power, while the second consists of the indirect or overhead costs of maintaining the packinghouse. Direct labor was discussed in detail in the preceding section of this report. This item averaged $0.156 for the 9 plants packing 3/4 bushels and $0.164 per bushel in the other 5 packinghouses. Packing materials are the most important single item of expense in preparing peaches for market. These materials cost $0.45 per basket for the 3/4 bushel and $0.47 for the full bushel. Only a slight variation was found in the prices paid for these materials by the packers whose operations were surveyed. The cost of ice and power was about $0.07 where the 3/4 bushel was packed and $0.08 where the full bushel was used.

As indicated in the North Carolina State College report on hydrocooling, the amount of ice used in cooling the packed peaches is in part dependent upon the effectiveness of the operation in reducing the temperature of the peaches and upon the quantity cooled in relation to capacity of the equipment. With ice prices and power rates about the same for all packers, the variations in the average per unit cost of these items must be attributed in large part to the relative efficiency of the cooling process from one packinghouse to another or even from one day to another in the same plant. Spot checks of peaches before and after cooling indicated an average temperature drop of almost 30 degrees and a final temperature of 52 degrees at the pit of the cooled fruit. A somewhat greater amount of ice would have been required to reduce the final temperature below 50 degrees, which is the level recommended, if maximum benefits are to be realized from the hydrocooling process.

Taken together, the direct expenses of packing totaled $0.67 per 3/4 bushel and $0.72 per bushel basket, which was equivalent to about 16 percent of the average gross returns realized on each of the two sizes of containers.

Repairs and maintenance averaged $0.02 per 3/4 bushel in the 9 plants and $0.01 per bushel in the other 5 packinghouses. There was a rather wide range in this item, which in any single plant normally tends to vary considerably dependent upon the nature of the upkeep work done in a given year and the volume of fruit packed during that particular season. Depreciation charges on a per unit packed basis also varied greatly from plant to plant. This cost averaged $0.07 among the packinghouses using the 3/4-bushel basket and $0.08 in the 5 plants that packed bushels.5/ The short crop of Carolina peaches in 1954 had an important effect on all overhead costs, including depreciation, where such costs were expressed on the basis of units packed. Other indirect expenses of operating a packinghouse, such as insurance, property taxes, interest, and accounting, averaged $0.05 per packed basket. Total indirect packinghouse costs were approximately $0.14 per basket for both the 3/4 bushel and the regular bushel. These costs were equivalent to about 3 percent of the average returns realized on the two sizes of baskets, f.o.b. initial point of delivery in the receiving market.

Net Return for Fruit

The net return for peaches, after adjusting for "grade-outs" and culls, averaged $2.16 per 3/4 bushel and $2.27 per bushel. In terms of the percentage of the value of the packed fruit delivered to market that is represented by the adjusted net return, the calculated return at packinghouse receiving platform averaged 50 percent on the peaches packed in 3/4-bushel baskets and 51 percent where full bushels were used.

By deducting from the value of the packed peaches, f.o.b. receiving market, the costs incurred in packing, shipping, and selling the fruit, it is possible to establish the net return for the peaches as they were delivered to the packinghouse receiving platform. In the packing process, however, varying quantities of fruit are picked out or discarded as culls and an adjustment must be made to reflect the lower value of these "grade-outs" in order to arrive at a net return for the orchard-run peaches as they are actually delivered to the packinghouse platform. The "cull" adjustment varies in direct proportion to the percentage of cull fruit picked out of the peaches packed during the observation period; it is also affected by the net price the packer is able to realize in selling the "pick-outs."

By using net weights of 41 pounds and 52 pounds 6/ for the 3/4-bushel and bushel containers, respectively, the return per pound of peaches delivered to the packinghouse platform in field boxes was $0.053 where the 3/4 bushel was packed and $0.044 where bushels were used. The range in net adjusted value among the 9 plants where 3/4-bushel baskets were packed was from $0.033 to $0.083 per pound. In the 5 plants using bushel baskets the value of the peaches delivered from the orchards to the receiving platform at the packinghouse ranged from $0.035 to $0.056 per pound.

It must be recognized, however, that the calculated net value is a potential return for orchard-run peaches and, depending upon methods of packing and selling used by growers, it may or may not have been realized by the peach growers involved.

5/ For the 14 packinghouses the average investment in physical facilities per plant was found to be $31,143, of which $12,679 represents the building and $18,464 the packing and cooling equipment.

6/ These weights represent the estimated average quantity of fruit packed in each of the two sizes of containers, as reported by several of the packers included in this study.

Extreme care should be exercised in drawing from the indicated returns any definite and unqualified conclusion that it is more profitable to pack peaches in 3/4-bushel baskets than it is to use the full bushel. The rapid shift toward use of the 3/4 bushel that occurred in 1954 would indicate that many peach packers in the Carolinas probably did believe that a better return could be obtained by making the change. In no case was it possible in the course of this study to observe the comparative returns from peaches marketed in the two containers where both were packed by the same shipper from the same lot of fruit. Differences in quality were obvious in the fruit packed by the various plants. Different varieties and times of sale were also involved. These factors would necessarily have a strong influence on prices received by the individual shippers.

In this study no direct effort was made to determine whether the net returns for fresh peaches were improved by the hydrocooling of the fruit. As has been noted above, all of the packers covered in the survey were using the coolers. If the assumption is made that hydrocooling does facilitate delivery of riper peaches and that consumers will pay a premium for such fruit, then net returns may be increased by the amount that the premium realized exceeds the cost of cooling or any other special handling required in marketing peaches at a more advanced stage of maturity. As a result of observations made while this work was in progress, it was apparent that the maximum potential benefits of hydrocooling were not being realized by all packers. The more common weaknesses noted were failure to reduce temperature of the fruit to below 50 degrees F. and a tendency to cool peaches that had not reached the stage of maturity at which they would be most acceptable to consumers. These shortcomings undoubtedly had some adverse effect on net returns for Carolina peaches.

ESTIMATED PACKING COSTS

During the past decade and particularly since the use of the hydrocooler has become more general, the number of peach packinghouses actually in operation in the Carolinas have decreased rapidly. In the Spartanburg area of South Carolina it is reliably estimated that the numbers of peach packinghouses have been reduced by almost 50 percent since 1948. At one time it was considered good management practice in the southeastern peach-growing area for each grower to have his own packing shed, but the attitude on this score appears to have been undergoing some marked changes. Declining production and the consolidation of orchard holdings have undoubtedly contributed to the trend toward fewer and larger packing plants.

Increasing belief in the industry that hydrocooling is a necessary operation in the marketing of southeastern peaches has tended to speed up the movement toward use of central packing plants that have a relatively large capacity. As a result, central packing on a custom basis has been gaining in usage, as the cost of hydrocooling units has precluded their installation in many of the smaller packinghouses.

In the course of this study, information was obtained on the estimated cost of a complete peach-packing plant that had been planned for construction by a grower in the Spartanburg area. The cost of this installation can be used to show the effect of different volume levels on the unit costs of packing peaches. It also serves to indicate the approximate cost of building and equipping a peach packinghouse at present prices for building materials and packinghouse equipment.

The estimated cost of this particular 7-roll peach-packing plant, having a capacity of 350-400 bushels per hour or approximately 75,000-100,000 bushels per season, that was planned in 1954 by an equipment-supply firm in South Carolina 7/ is as follows:

Building (shed type)	$ 8,000
Equipment (includes 50-foot cooler)	20,600
Total	$28,600 8/

On the basis of the schedule of fixed costs of operating Carolina peach-packing plants, as developed during the current study of 14 operations, it is estimated that on an annual basis such costs for this type of packinghouse would be the following:

Depreciation (building)	$ 400
Depreciation (equipment)	2,060
Insurance (fire and liability)	500
Taxes (real estate)	150
Repairs and maintenance	750
Interest	815
General	685
Total fixed costs, per annum	$5,360

Table 8 and figure 3 are designed to show the influence that varying rates of facility utilization exert on the unit cost of packing peaches. The fixed costs are based on the schedule developed for the 7-roll packing plant. Variable costs are taken from the experience of those Carolina packinghouses in which observations were made in July 1954. Of particular interest in this analysis is the fact that the fixed costs at levels of operation above 30,000 bushels, which represents perhaps one-third of capacity, are a relatively minor part of the total packing cost. This does not mean, however, that it is unimportant to operate a packinghouse above a minimum volume level. For example, the difference in unit cost between a volume of 30,000 bushels per season and an output of 50,000 bushels is over 7 cents per bushel. Above 50,000 bushels the unit cost declines further, but at a less rapid rate. A reasonable goal would be to keep operations at some level above 50 percent of capacity. However, plans of this sort are often upset in the packing of peaches or other types of produce due to the sometimes extreme variations in crops from year to year.

7/ Estimate prepared in 1954 by the South Carolina Peach Growers Association for a peach-packing plant at Spartanburg, S. C.

8/ By coincidence this estimated cost of the model plant does not differ greatly from the average investment of $31,143 in the 14 packinghouses covered by this study.

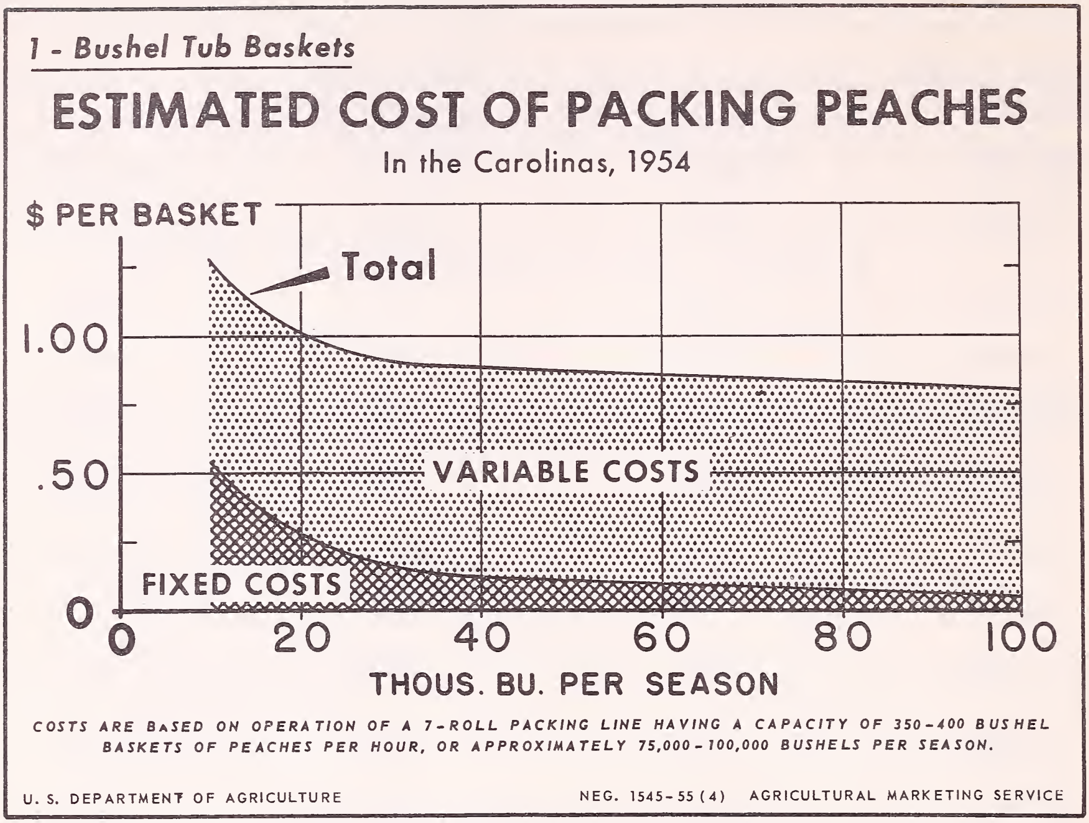
Table 8.--Estimated costs of packing peaches in bushel baskets, North and South Carolina, 1954

Quantity packed per season	Packing costs		
	Fixed 1/	Variable 2/	Total
Bushels	Dollars	Dollars	Dollars
10,000......	0.536	0.750	1.286
20,000......	.268	.750	1.018
30,000......	.179	.750	.929
40,000......	.134	.750	.884
50,000......	.107	.750	.857
60,000......	.089	.750	.839
70,000......	.077	.750	.827
80,000......	.067	.750	.817
90,000......	.060	.750	.810
100,000......	.054	.750	.804

1/ Based on fixed costs of maintaining and operating a 7-roll packing line and a 2-unit hydrocooler having a capacity of 350-400 bushel baskets of peaches per hour, or approximately 75,000-100,000 bushels per season.

2/ Based on average costs of packing materials, direct labor, ice, and power as indicated by survey of Carolina peach packinghouses in July 1954. No allowance is made (1) for the relatively small potential saving in cost of packing materials and ice that may be realized as the volume increases above the 10,000 bushel level or (2) for variations in the unit cost of ice as the result of the relatively fixed amount of ice required to reduce the temperature of the water in the hydrocooler before each run.

It is of interest to note that the estimated costs of packing peaches at the 50,000 bushel level, which is about 50 percent of probable maximum capacity of the model plant, are very close to the actual average cost experienced by the 5 packinghouses using bushel baskets where observations were made in July 1954. Actual cost was $0.859 per bushel (table 7) while the estimated costs totaled $0.857 per bushel. After making some adjustment for the observed difference in the variable costs of packing 3/4 bushels instead of the full bushel, the average of $0.813 for the 3/4-bushel basket in 9 plants (table 6) was not far out of line with the estimated cost per bushel at the 50,000 bushel level. On the strength of estimates made by the



1 - Bushel Tub Baskets

ESTIMATED COST OF PACKING PEACHES

In the Carolinas, 1954

COSTS ARE BASED ON OPERATION OF A 7-ROLL PACKING LINE HAVING A CAPACITY OF 350-400 BUSHEL BASKETS OF PEACHES PER HOUR, OR APPROXIMATELY 75,000-100,000 BUSHELS PER SEASON.

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Figure 3

individual packinghouse operators, it is likely that on the average the 14 packing plants covered by this study were actually not operating at much more than 50 percent of normal capacity in 1954.